

National Workshop

Urban Water Systems in India: A Way Forward



24X7 Water Initiative and Waste Water Reuse

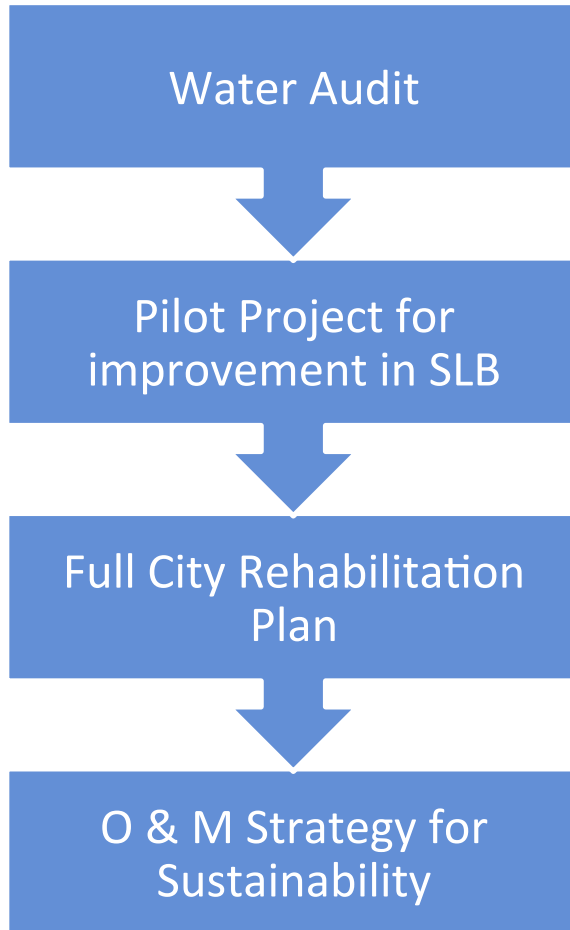
Case Study Nagpur

23rd Feb. 2015

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Nagpur 24x7 - Policy & Strategy for Implementation

Implementation Steps



Admn/Political Reforms

Rationalization of
Tariff
Billing & Collection

Customer
Management &
Awareness

Slum Policy for
Water Supply

Technical Efficiency

Raw Water
Energy
Consumption

Pumping
Treatment
Transport
Storage

Distribution
Consumer
Connection
Metering

CHRONOLOGICAL BULK WATER SUPPLY

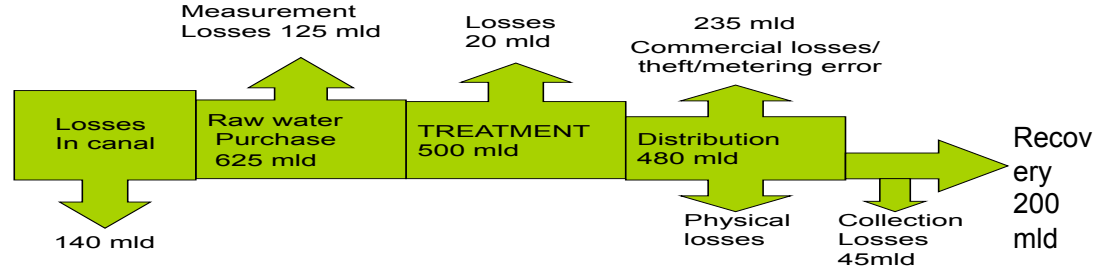
Year	Population	Water Supply in mld	Ltrs / Person	Sources
1921	145000	16.50	114	Ambazari + Gorewada
1941	302000	45.00	149	Ambazari + Gorewada + Kanhan
1961	644000	80.00	124	Ambasari + Gorewada + 1st Aug. Kanhan
1981	1217000	125.00	103	Ambazari (discarded) , Gorewada + 3 Times Aug. to Kanhan
2001	2150000	370.00	172	Gorewada + Kanhan + Pench - I + Pench -II
2004	2350000	470.00	200	Gorewada + Kanhan + Pench - I + Pench -II + Pench -III
2011	2500000	600.00	240	Gorewada + Kanhan + Pench - I (Jnnurm-Partial) + Pench -II + Pench -III
2014	2750000	765.00	278	Gorewada + Kanhan + Pench - I + Pench -II + Pench - III+JnNURM

Bulk water Security – is not end of the problem ...

low efficiency resulted in to higher water losses, poor financial position , deteriorated assets, frequent contamination of water affected the public health specially urban poor and overall unsatisfied citizen services.

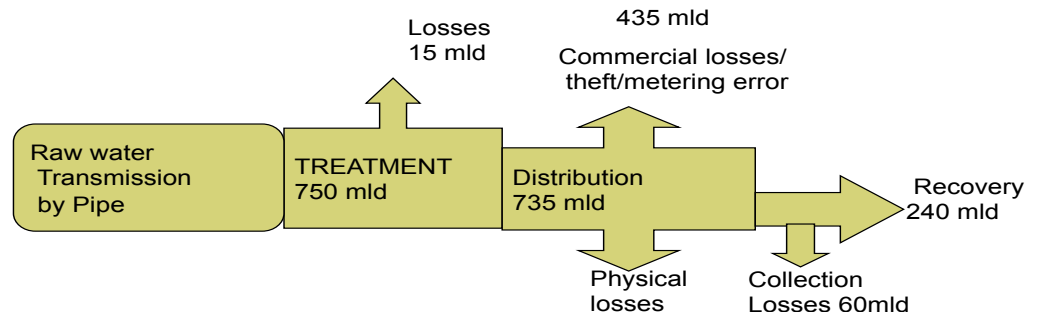


STATUS BEFORE REFORMS



STATUS AFTER IMPLEMENTATION OF REFORMS (EXCLUDING 24X7 W.S. PROJECT)

Augmentation in water supply is not a answer to above challenges

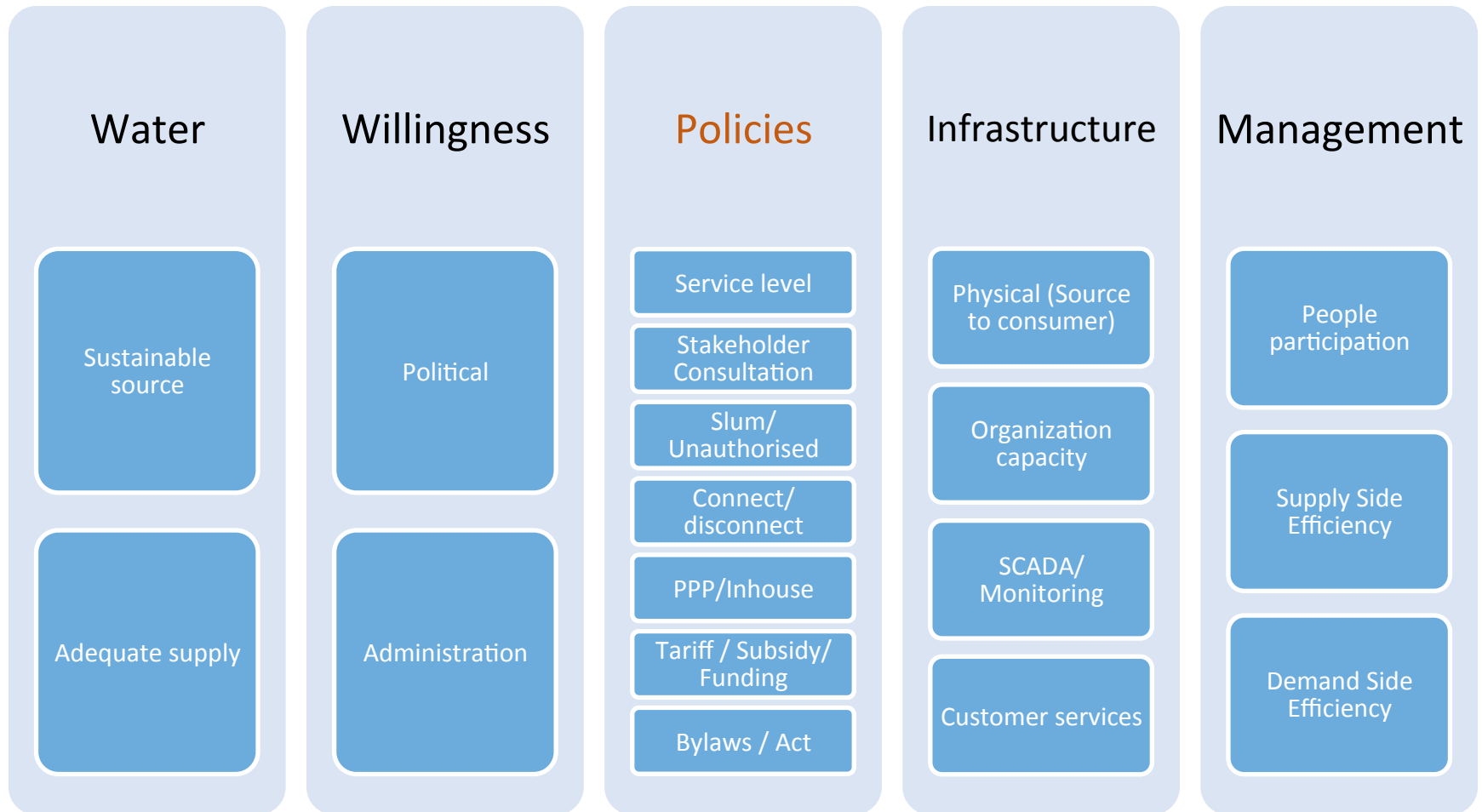


Water Tariff Revision Policy of NMC

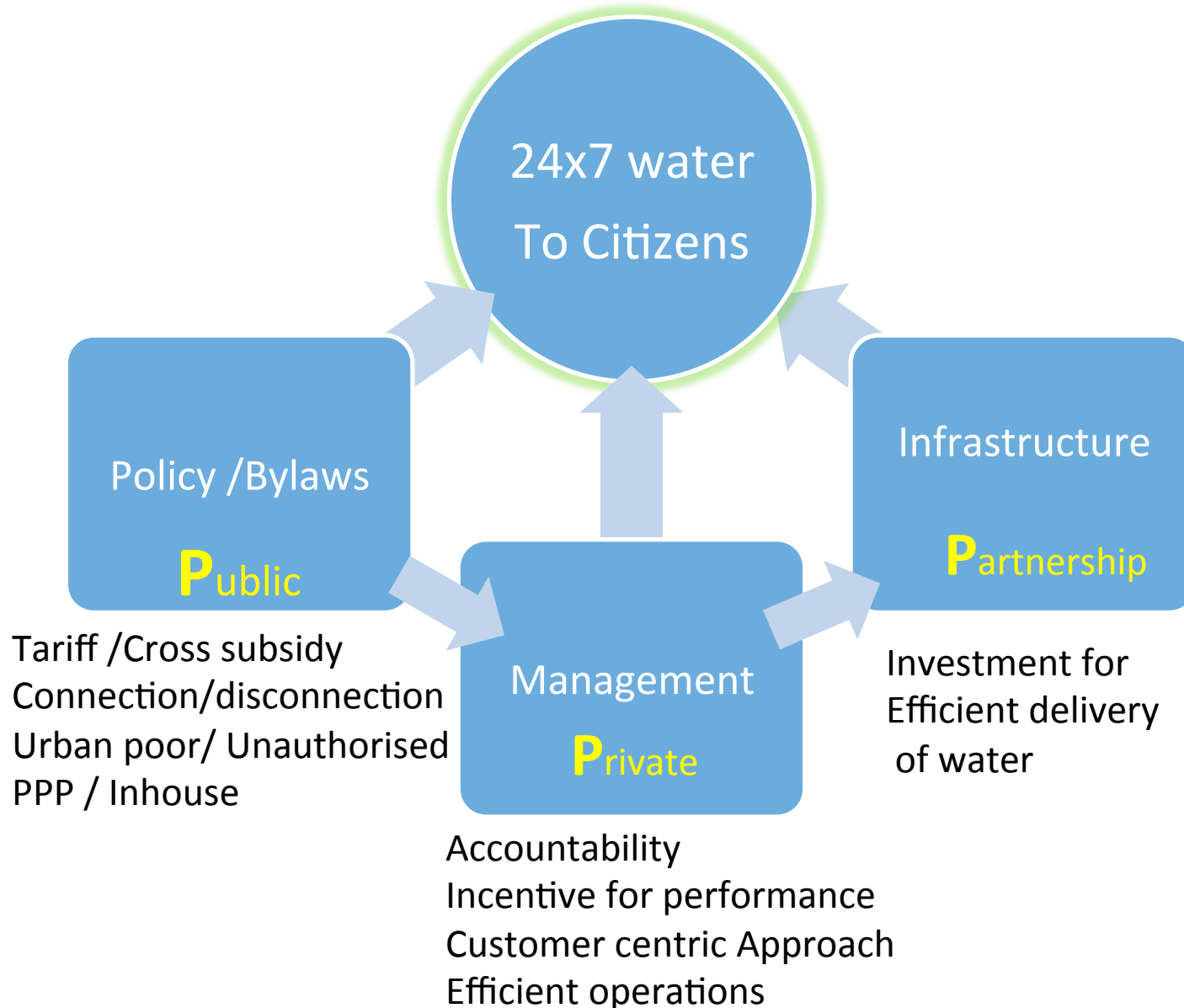
Tariff revisions implemented before the entry of Private Operator with following objectives:

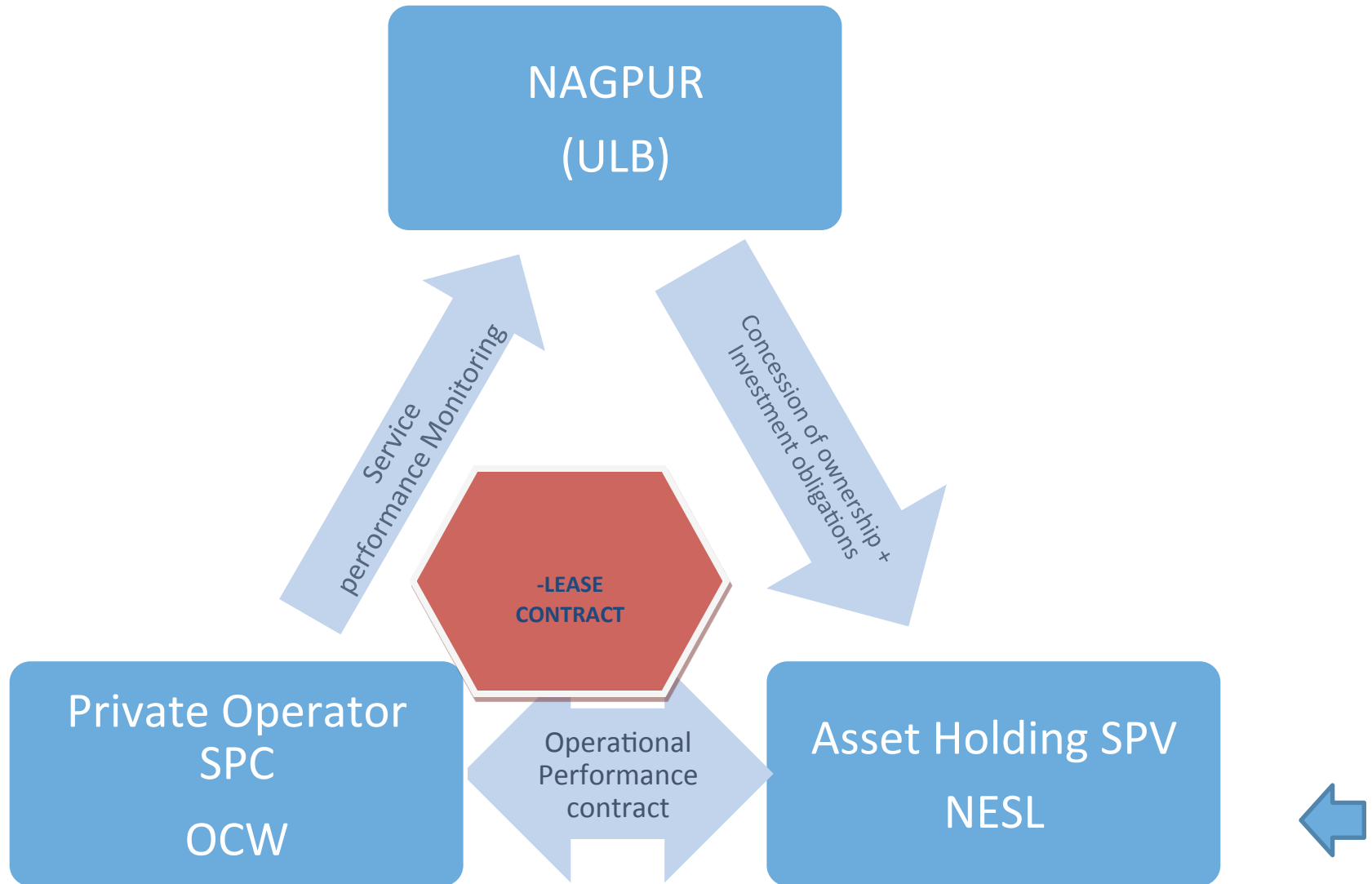
- No tariff revision since year 2000, and also need for rationalization for sustainability.
- Tariffs revision to meet Operating expenses and part of capex.
- Telescopic tariff to promote water conservation.
- Affordable supply for life line volume, subsidized supply for consumption within the norms and premium rates for consumptions higher than the norm.
- Tariff flexibility to cope up with ever increasing energy & raw water tariffs (which constitute almost 40% of the total cost) owing to inbuilt provision to pass on the increase in input cost of raw water and energy directly to the consumers as surcharge.
- Autonomy for tariff fixation and minimum 5% increase in tariff every year.
- ULB all tariff related issues of consumers before the entry of put operator.

Key Requisites for 24x7 W.S. Initiative



Nagpur Holistic Approach





NESL Water Company

Salient Features

- Ownership of assets with NMC.
- Transfer of assets of NMC to NESL for operation, maintenance and management only.
- Water charges will continue to be decided by NMC.
- Apart from water supply, company can take up work of sewage disposal and solid waste management in future.

PPP under JnNURM

NMC INTRODUCED PPP TO ADDRESS THE CHALLENGES OF INTEGRATED WS MANAGEMENT AND ACCOUNTABILITY FOR PERFORMANCE

- 24/7 Water Supply (Rs 20 Crore) – Demo Zone
 - 5 years O & M with performance based targets to reduce UFW and improvement in service level to customers in a pilot zone of 1.50 lakhs population.
- Improvement to Kanhan Water Supply (Rs 65 Crore)
 - 70% grant in aid, 30% by private operator
 - 15 Years O & M by operator
- Water Distribution Monitoring System
 - 25% investment by private agency
 - 5 years comprehensive O & M
- Meter replacement, Billing & Collection for 10000 large consumer
 - 50% of capital cost by Private agency
 - 5 years of O & M contract



PPP under JnNURM

- PENCH-I WTP Improvement & Up gradation (Rs 6.42 Crore)
 - 70% grant in aid, 30% by private operator
 - 5 Years O & M by operator
- Water reuse For Power Plant (Rs 130 Crore)
 - 70% grant in aid, 30% by Mahagenco
 - Mahagenco to carryout O & M and pay to NMC the raw sewage charges @ Rs3.0 – 3.50 per 1000 Ltr. for 110 MLD. Annual revenue to NMC Rs 15 crore from sewage



PPP for City-wide water supply

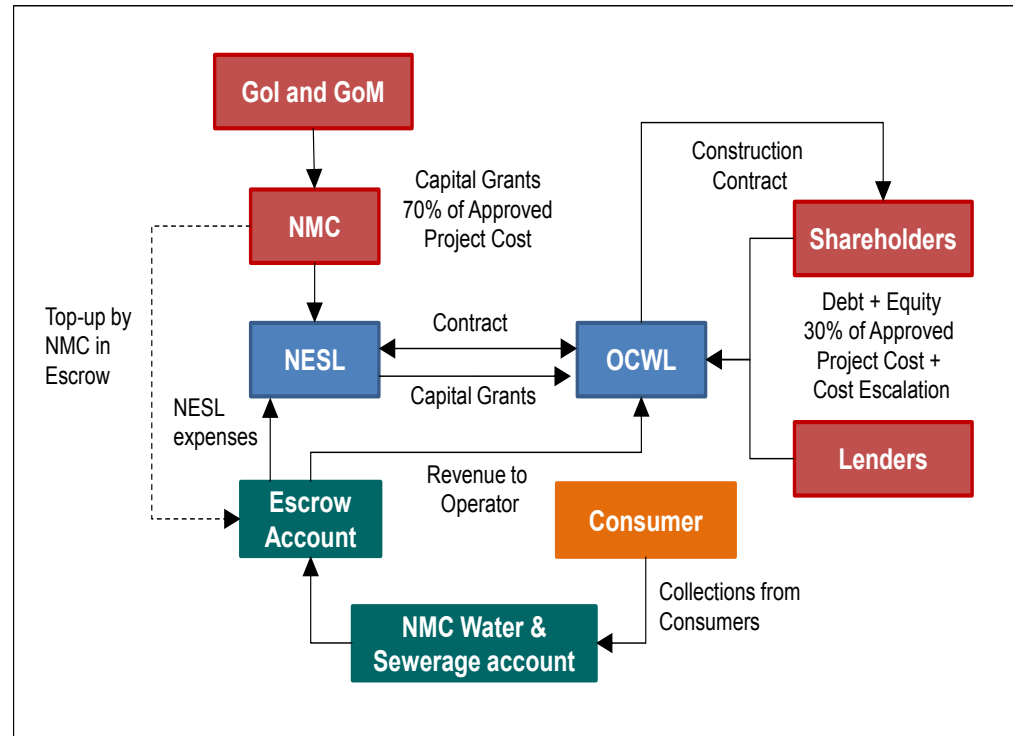
Project inception

- In 2008, NMC' s General Body passed resolution for city-wide 24x7 water supply
- PMC was appointed for the project and DPR and PPP format were prepared
- Approval for funding under JNNURM was obtained in early 2009.
- Ring-fencing of water supply assets was done by transferring of water supply functions to a separate company i.e. the Nagpur Environmental Services Limited (NESL) as a wholly owned subsidiary of NMC.
- The bid process initiated with a Request for Qualification (RFQ) in 2008.
- 3 of the 10 applicants shortlisted and RFP was called for from
 - Veolia-Vishvaraj consortium,
 - IVRCL-Aqualia,
 - Cascal-Nagarjuna Construction
- Transparent bidding process adopted with extensive stakeholders consultations
 - Consortium of Veolia India and Vishvaraj Infrastructure Ltd. was declared the winning bidder with the final bid price of Rs. 7.90 per KL
 - Tri-party agreement between OCWPL (SPV was set up by Veolia-Vishvaraj consortium), NMC and NESL signed in June 2011.

Features of the PPP agreement

- **Project scope**

- 25-year Performance Management Contract (extendable for another 25 years)
- First 5-year OCWPL responsible for O&M of existing network and rehabilitation of the network
- O&M of the water supply system for next 20 years
- Revenue and collection risk loaded on Operator
- Operator's performance to be monitored against performance parameters
- Remuneration based on metered volume that is billed and collected.



Full City SLB Targets for PPP

To become first million plus city to achieve Service level Benchmark of water supply in India

	Service Level Benchmark (SLB)	Status at 2009	Benchmark (MoUD)	Targeted Year*
1	Coverage of Water Supply	84%	100%	5 Yrs
2	Per Capita Supply of Water	240 LPCD	150 LPCD	10 Yrs
3	Continuity of Supply	3 – 8 hrs	24 hrs	5 yrs
4	Extent of Metering of Water Connections (working meter)	<50% (accuracy?)	100%	5 yrs
5	Extent of Non-revenue water	60 – 70 %	20%	10 yrs(< 40% 5 yrs)
6	Efficiency in Redressal of Complaints in 24 hrs	No tracking	80%	5 yrs
7	Quality of Water	Mix supply	100%	5 yrs
8	Operating Cost recovery in water supply services	70-75%	100%	6 yrs
9	Efficiency in collection of water related charges	70-75%	95%	10 yrs

24x7 Pilot Project

- Feature
 - 15000 Connection including slum
 - 10 slum areas
 - Population 1.75 – 2 lakhs
- Contract
 - Study, Rehabilitate, Management contract with Private operator.
 - Penalty /bonus for targets in Water losses, Quality, Customer services and Continuity of supply
- Results Expected
 - 100% metering
 - Rehabilitation of tertiary network
 - Hydraulic modeling as per master plan
 - Installation of new billing system
 - Customer facility center

First Phase Conversion

Command areas

- Dhanoli (81(p),87(p),88
- Ramdaspeth -81 (p)
- Laxminagar (old) 86(p), 87(p), 109 (p) 110(p)
- Pratap Nagar 117(p), 118(p), 119 (p)
- Laxmi Nagar (New) 108(p), 109(p)
- Burdi – Part 49(p), 80,81(p)
- Shantinagar- 33,34(p),57,58
- Bharatwadi (NMC)- 30(p), 59(p)

Coverage – 16 wards

81,87,88,86,33,34,57,58 (100%)

Total 24311 connection

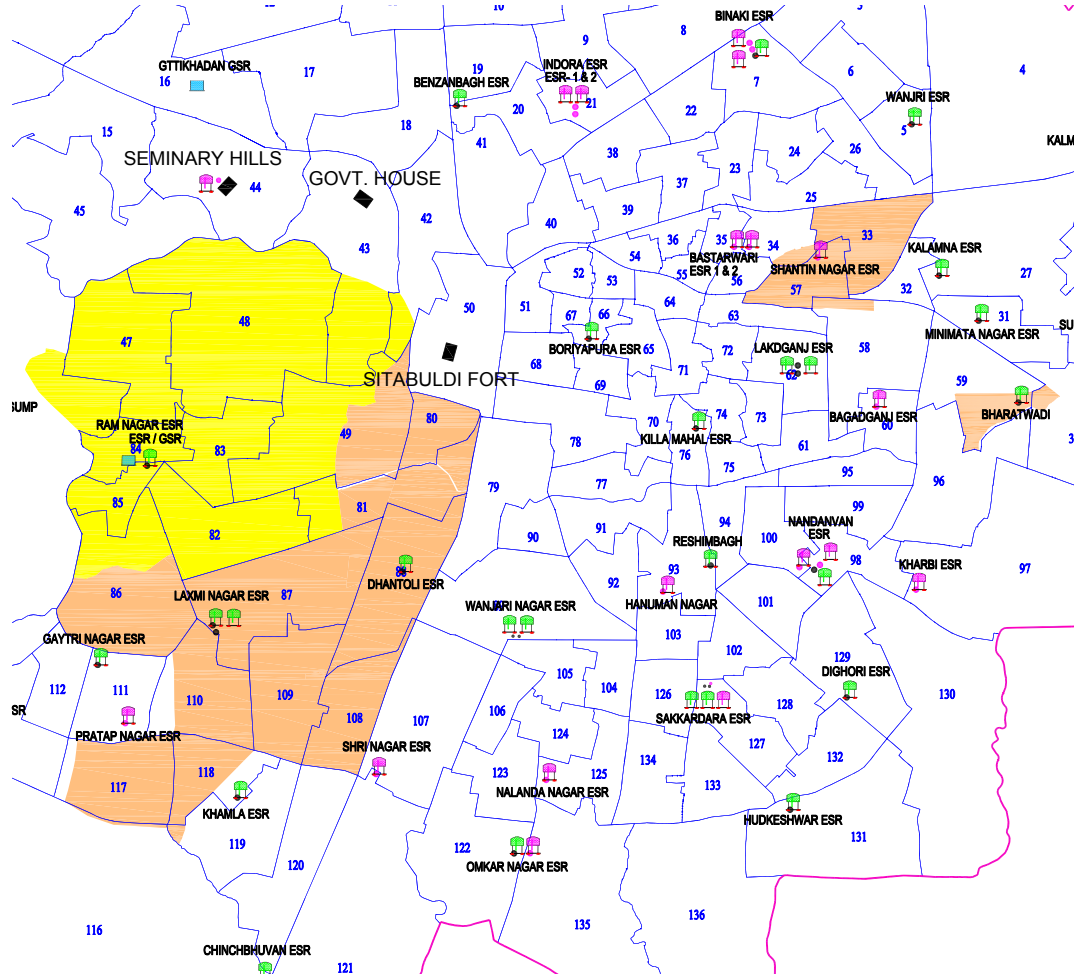
Additional Population – 175637

Expenditure (100%)

Network – 96.50 lacs(Laxminagar)

HSC – 139.71 lakhs

Time Period – 3 months (March 15)



Project progress and current status

- As on December 2014, physical progress of 75% achieved with over 434 km out of 564 km of pipeline replaced.
- Delays in provision of house service connections due to protests against imposition of connection charges. As against a target of 321,000 connections, about 75,000 connections have been completed.
- To overcome this NMC passed a resolution waiving connection charges for all connections in July 2014
- Round-the-clock call centre with a toll-free number setup to address consumer grievances.
- Online Water Bill payment facility put in place.
- **Discontinuation of JNNURM scheme has hampered the progress of the project; A new follow up scheme at the earliest is needed**

Important Lessons from 24x7 Water Supply Demo Project

- Public relation
- Customer services (Setting of Grievances Redressal Centre)
- Tariff
- Frequency of Bills
- Post meter leakages
- Awareness period – Dummy bills
- Restoration of Road Cuts, trenches
- Sensitive Water Meters

Challenges Ahead

- 1) Sustained support / commitment of Public Partner to the Project.
- 2) Timely release of grants by government & its timely utilisation
- 3) Specialist expertise and competency building.
- 4) Strengthen the public relations and communication function to gain improved support.
- 5) To strengthen performance focus at the field level.
- 6) Managing PPP relationship & public expectations.
- 7) Replacement of consumer connections and addressing last-mile and internal plumbing issues will need to be tackled head-on as these aspects are critical to consistently deliver 24x7 supply.

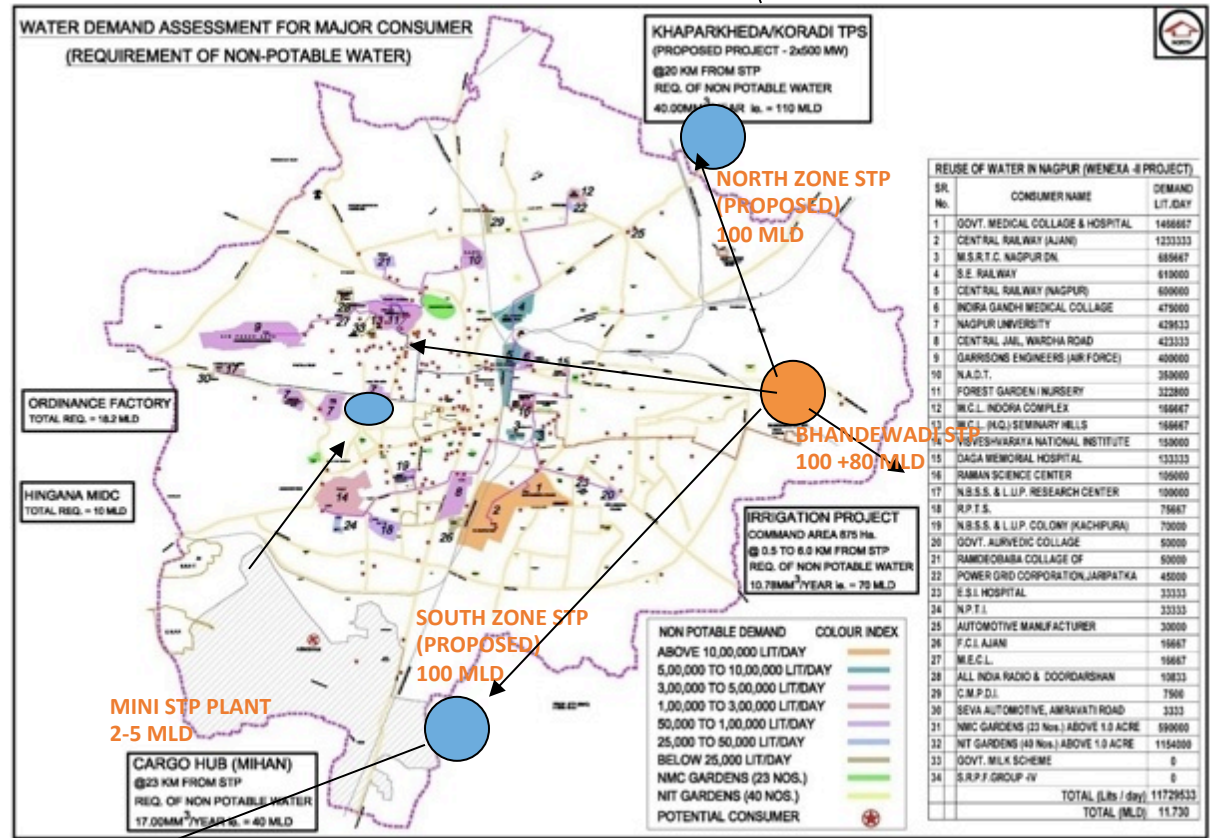
Recycle & Reuse of Waste Water

Water Reuse Opportunity in Nagpur region

Name of the Sewage Treatment Plant	Design Capacity STP (Mld)	Sewage Generation (Mld)	Name of User	Demand (Mld)
North Zone (Proposed)	0	117	Mah. State Power Generation Company (MAHAGENCO)	130
Central Zone		142	Reuse in Nagpur City	
Existing	100		Immediate	10
Mahagenco	130		Ultimate	25
			Irrigation Project	70
South Zone		86	MIHAN (Cargo Hub)	40
Proposed under PPP	200			
Total Capacity (Mld)	430	345	Total Demand	275

NMC WATER REUSE MASTER PLAN

Consumer	Water Reuse In mld
MAHAGENCO Swap for ext	110 150
MIHAN	40
IRRIGATION	70
CITY BULK	25
TOTAL	245 +150 =395



Additional reuse potential for future power plants and irrigation swapping to consume all effluent

ECONOMICS OF WATER REUSE

ECONOMICS OF WATER REUSE			
Sr. No.	Organisation / User	Non-Potable Water	
		Demand (Mld)	Project Cost (Crores Rs.)
1	Nagpur City Reuse	25	37.00
	Sewage Treatment Plant (South Zone:Ghogali 100 mld)		50.00
2	Mah. State Power Generation Co. Ltd. (MSPGCL)	110	125.00
3	Irrigation Project	70	5.00
4	MIHAN (Cargo Hub)	40	46.00
	Total	245	263.00
	Cost Per Mld (in Crores Rs.)	1.07	
	Average Fresh Water Project Cost per Mld (in Crores Rs.)	3.00	

Future Bulk Water Security- Nagpur

Comparative Investment Analysis

Without Reuse of water

DEMAND		SOURCES		
CONSUMER	QTY IN mm3/Yr	EXISTING/ PLANNED SOURCES	QTY IN mm3/Yr	INVESTMENT IN CRORE
NMC	393	PENCH	112+78	450
		KANHAN	55	
		RAHARI	128	300 + 700
		KOCHI	20	250 + 300
CARGO HUB MIHAN	50	LOWER WANNA	15	
MSEB/POWER GENERATION	127	PENCH + KOCHI	67 + 40	
TOTAL	570		515 (-55)	2000

With reuse of water

DEMAND		SOURCES		
CONSUMER	QTY IN mm3/Yr	EXISTING/ PLANNED SOURCES	QTY IN mm3/Yr	INVESTMENT IN CRORE
NMC	393	PENCH	112+78	
		KANHAN	55	
		RAHARI	128	300 + 700
CARGO HUB MIHAN	50	LOWER WANNA	15	
MSEB/POWER GENERATION	127	PENCH	67 (may b swap with NMC)	300
		REUSE POTENTIAL	300 (395)	300
TOTAL	570		755 (+185 + 67 = 252)	1300 (600)

Project 1 - 200 MLD STP in Nagpur on PPP with Reuse, Maharashtra

Objective

- Providing Sewage Treatment for 200 MLD and possible Reuse by potential Customers in Nagpur

Salient Features

- Project Cost: 260 Crs
- Revenue: Annuity Payment to Operator
- Option with resale with revenue sharing mechanism
- Concession Period: 32 years



Status – Operator already selected through bidding process, contract under execution

Project 1 - 200 MLD STP Project – Key Terms

Revenue from operations	• SPV is entitled to fixed Capital Grant & Operational Grant with adjustment for inflation from start of O&M Phase • Additionally Concessionaire has a right to sell 175 MLD of tertiary treated water on payment of Royalty to NMC
Alignment with operator's economic interest	• No charge for sewage • Option to sell tertiary treated water to industrial consumers • Any hike in electricity tariff will be pass through. • Electricity payment to be made directly by NMC and adjusted against O&M grant payment.
Payment security	• Escrow receipts (Rs 15 Crore) from Mahagenco to secure its payments to SPV • Reserve equal to three months grant payment • NMC rated A+ by Fitch
Security to lenders	• Step in rights to lenders by way of substitution agreement

Project 2 – 130 MLD STP at Bhandewadi

- 1) Partnership project between NMC and MAHAGENCO
- 2) MAHAGENCO to build 130 MLD STP
- 3) NMC to supply sewage @ cost of Rs. 15 Crs per annum
(to be escalated)
- 4) Project under JNNURM
- 5) Project nearing completion
- 6) The treated water to take care full water demand of
Koradi 660x3 MW new power plant

Status – Operator already selected through bidding process, contract under execution

Waste Water Initiatives for Nag River Public Awareness Program

Stretches Of The River

- Total Length 17.50 KM
- Width of the river 20 - 45 meters
- Depth of the river 0.7 - 4.5 meters

No of Stretches 6 Nos.

- Stretch I AMBAZARI - PANSHEEL TALKIES
- Stretch II PANSHEEL - BAIDYNATH
- Stretch III BAIDYNATH - JUNI SHUKRAVARI
BRIDGE
- Stretch IV JUNI SHUKRAVARI BRIDGE -
KDK COLLEGE
- Stretch V KDK COLLEGE - PARDI BRIDGE
- Stretch VI PARDI BRIDGE - PUNAPUR CULVET

Public Participation And Awareness Programme



HUMAN CHAIN BY DIGNITORIES & CITIZENS OF NAGPUR AT BEGINNING OF DRIVE



Human Chain Continue...





- STRETCH NO - 1

AT COMPLETION





- STRETCH NO - 2

AT COMPLETION





- STRETCH NO - 3

AT COMPLETION





- STRETCH NO - 4

AT COMPLETION





- STRETCH NO - 5



THIS STRETCH WAS CLEANED BY REMOVING
THE GARBAGE



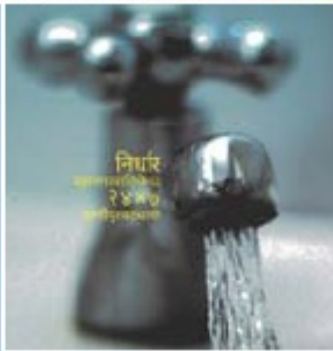
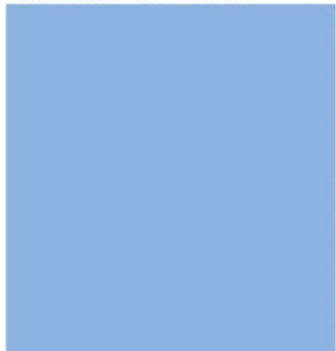
- STRETCH NO - 6

AT COMPLETION









THANK YOU